

## PATENT COOPERATION TREATY

PCT

08.09.2004

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

REC'D	14 SEP 2004
WIPO	PCT

Applicant's or agent's file reference F17310 ASMJS/vd	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/IB 03/01977	International filing date (day/month/year) 23.05.2003	Priority date (day/month/year) 10.06.2002
International Patent Classification (IPC) or both national classification and IPC B41M1/24		
Applicant NAMPAK PRODUCTS LTD et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
  
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 9 sheets.
  
3. This report contains indications relating to the following items:
  - I  Basis of the opinion
  - II  Priority
  - III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV  Lack of unity of invention
  - V  Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI  Certain documents cited
  - VII  Certain defects in the international application
  - VIII  Certain observations on the international application

Date of submission of the demand 08.12.2003	Date of completion of this report 15.09.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Balsters, E Telephone No. +31 70 340-4015 

INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

International application No. PCT/IB 03/01977

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

3-5, 7-13	as originally filed
1, 2, 6	received on 14.06.2004 with letter of 14.06.2004

**Claims, Numbers**

1-30	received on 14.06.2004 with letter of 14.06.2004
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**Drawings, Sheets**

1/1	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-30
	No: Claims	
Inventive step (IS)	Yes: Claims	1-30
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-30
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

(1) JP 02 072385  
(2) US 5 238 516

The application concerns a process and apparatus for producing an elongated web of material which comprises a partial coating of a material applied by printing and embossed to create an optically variable device, followed by metallisation of the whole web surface. The process steps are carried out in line and continuously.

The closest prior art is represented by document (1), see abstract and figure, which discloses the creation of a sheet by providing (by printing) a partial coating which may be embossed, followed by metallisation of the complete sheet. The disclosure of the present application differs from (1) in that the teaching of the present application is directed to the continuous printing and embossing of an elongated web of material rather than a single sheet. The process of present claim 1 and the apparatus of present claim 22 must thus be acknowledged as novel as no prior art disclosure has been found which discloses all features of the claims in question. The application is thus deemed to satisfy the requirements of Article 33(2) PCT with respect to novelty.

The problem addressed by the present application may be seen as the provision of an efficient process for the creation of repeating designs along an elongated web of material, and an apparatus suitable for carrying out said process. Document (1) speaks of the provision of a complicated pattern in a desired shape at a specific position. There is no suggestion in (1) to have a series of workstations providing continuous printing and embossing along a web of material, the teaching of (1) appears to advocate batch processing. Considering document (2), which discloses a continuous process, see figures 1 and 2 of (2), whereby a web is coated with a "release layer" which is continuously embossed by a roller and then (see figure 2) metallised all over, it is clear that continuous processing of webs is known, but without the aspect of only partial coverage of the coating material to be embossed. The teaching of partial printing and embossing combined with full metallisation of a web as a continuous process appears derivable from the available prior art only with hindsight. The skilled man has no hint to combine features of documents (1) and (2) in order to achieve the particular set of process steps disclosed by the present claim 1, nor an apparatus as disclosed by claim 22. Claims 1 and 22 are thus found to comprise inventive merit as required by Article 33(3) PCT.

Dependent claims 2-21 and 23-30 are considered to meet the requirements of Article

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33 PCT in that they are dependent upon claims meeting said requirements.

**PRINTED, EMBOSSED AND METALLIZED MATERIAL**

**THIS INVENTION** relates to printed material. More particularly, the Invention relates to a process for producing printed material suitable for, but not limited to, packaging. The Invention also relates to an apparatus or installation for producing such printed material, and to a flexible printed material whenever produced in accordance with the process or by means of the apparatus or installation.

According to the invention there is provided a process for producing printed material comprising an elongated web of flexible sheet material, the process including the process steps of:

printing an embossing coating on a surface of a major face of a web of said sheet material;

embossing the embossing coating printed on said major face by means of an optically variable device; and

metallising said surface of said major face with a metal coating,

to produce a web of flexible sheet material having a major face which is embossed, said major face being metallised,

the printing and the embossing being carried out in-line and continuously until a desired length of the surface of the web has been embossed;

the web being advanced continuously past a series of work stations where the in-line process steps are respectively carried out, the series including a printing station where the printing of the embossing coating continuously takes place and an embossing station, following the printing station, where the embossing continuously takes place;

the printing of the embossing coating being on a portion of said surface of said major face; and

the metallising being of the entire surface of said major face,  
so that said major face of the web is partially embossed, the whole of said major face being metallised.

More particularly, the flexible sheet material may be a transparent flexible polymeric plastics film.

The process may include the further step of colour-printing said major face of the web, the colour-printing being carried out continuously and in-line with the printing of the embossing coating and in-line with the embossing. Preferably, the colour-printing is confined to at least one unembossed portion of the surface of said major face.

The colour-printing may be by means of a printing cylinder using a gravure printing technique, although any other suitable printing technique can naturally be employed instead. Preferably, the colour-printing cylinder forms part of a gravure printing press.

In particular, the colour-printing may be carried out prior to the printing of the embossing coating.

In other words, the colour-printing may be carried out prior to the metallising and optionally prior to the printing of the embossing coating, between the

station and the embossing station.

More particularly, as indicated above, the embossing step and each printing step may be carried out by separate cylinders forming part of a single gravure printing press.

The invention extends to an apparatus or installation for producing printed material, the apparatus or installation comprising a plurality of processing stations, the processing stations including:

an embossing coating printing station for printing an embossing coating on a surface of a major face of an elongated web of flexible sheet material;

an embossing station for embossing the embossing coating printed on the web at the printing station; and

a metallising station for metallising said surface of said major face,

the printing station and the embossing station being arranged in-line;

the apparatus or installation being arranged and constructed continuously to advance an elongated web of flexible sheet material in succession past said printing station and said embossing station; and

the embossing coating printing station being for printing the embossing coating on a portion of said surface of the major face.

Conveniently the apparatus or installation is arranged and constructed to advance the elongated web of flexible sheet material past the embossing station and then to the metallising station, to facilitate metallising the entire surface of said major face, or part thereof.

**CLAIMS:**

1. A process for producing printed material comprising an elongated web of flexible sheet material, the process including the process steps of:

printing an embossing coating on a surface of a major face of a web of said sheet material;

embossing the embossing coating printed on said major face by means of an optically variable device; and

metallising said surface of said major face with a metal coating, to produce a web of flexible sheet material having a major face which is embossed, said major face being metallised,

the process being characterized in that

the printing and the embossing are carried out in-line and continuously until a desired length of the surface of the web has been embossed;

the web is advanced continuously past a series of work stations where the in-line process steps are respectively carried out, the series including a printing station where the printing of the embossing coating continuously takes place and an embossing station, following the printing station, where the embossing continuously takes place;

the printing of the embossing coating is on a portion of said surface of said major face; and

the metallising is of the entire surface of said major face,

so that said major face of the web is partially embossed, the whole of said major face being metallised.

2. A process as claimed in Claim 1 characterised in that the flexible sheet material is a transparent flexible polymeric plastics film.

3. A process as claimed in Claim 1 or Claim 2, characterised in that it includes the further step of colour-printing said major face of the web, the colour-printing being carried out continuously and in-line with the printing of the embossing coating and in-line with the embossing.
4. A process as claimed in Claim 3, characterised in that the colour-printing is confined to at least one unembossed portion of the surface of said major face.
5. A process as claimed in Claim 3 or Claim 4, characterised in that the colour-printing is by means of a printing cylinder using a gravure printing technique.
6. A process as claimed in Claim 5, characterised in that the colour-printing cylinder forms part of a gravure printing press.
7. A process as claimed in any one of Claims 3 to 6 inclusive, characterised in that the colour-printing is carried out prior to the printing of the embossing coating.
8. A process as claimed in any one of the preceding claims, characterised in that the metallising step and any additional process steps, other than in-line printing and embossing steps, are carried out batchwise.
9. A process as claimed in any one of the preceding claims, characterised in that the embossing by means of an optically variable device is selected from the group consisting of holographic embossing, stereographic embossing, diffraction grating embossing, dot matrix embossing and combinations thereof.

10. A process as claimed in Claim 9, characterised in that the embossing is holographic embossing.

11. A process as claimed in any one of the preceding claims, characterised in that the embossing is such as to provide the embossed web with an at least partially repeating embossed pattern.

12. A process as claimed in any one of the preceding claims, characterised in that it includes the further process step of laminating the embossed metallised web with a backing web of flexible sheet material, to provide a laminated composite material, in which the embossing, the metal coating and any colour-printing are sandwiched between the webs so that the embossed metallised web is reverse-printed, at least one of the webs being transparent.

13. A process as claimed in any one of the preceding claims, characterised in that it includes the steps of slitting the embossed metallised web lengthwise into at least two strips, and rolling said strips into rolls.

14. A process as claimed in any one of the preceding claims, characterised in that each said web is made of a polymeric material selected from the group consisting of polyesters, polypropylenes, polyethylenes and polyvinyl chlorides, and mixtures, blends and copolymers thereof.

15. A process as claimed in Claim 14, characterised in that the polymeric material is selected from polyesters and polypropylenes, the metallising being by vacuum metallising.

16. A process as claimed in any one of the proceeding claims, characterised in that the metallising step is carried out by means of aluminium.

17. A process as claimed in any one of the preceding claims, characterised in that the embossing coating is solvent-based, the embossing coating being printed by means of a printing cylinder.

18. A process as claimed in Claim 17, characterised in that the embossing coating is provided by the printing cylinder using a gravure printing technique, the cylinder forming part of a gravure printing press.

19. A process as claimed in any one of the preceding claims, characterised in that the embossing is by means of an embossing cylinder, carrying a holographically engraved cylindrical surface.

20. A process as claimed in Claim 19, characterised in that the embossing cylinder forms part of a gravure printing press.

21. A process as claimed in any one of the preceding claims, characterised in that the embossing step and each printing step are carried out by separate cylinders forming part of a single gravure printing press.

22. An apparatus or installation (10) for producing printed material, the apparatus or installation comprising a plurality of process stations (24, 32, 40), the process stations including:

an embossing coating printing station (24) for printing an embossing coating on

a surface of a major face of an elongated web of flexible sheet material;  
an embossing station (32) for embossing the embossing coating printed on the web at the printing station; and  
a metallising station (40) for metallising said surface of said major face,  
the apparatus or installation being characterised in that:  
the printing station and the embossing station are arranged in-line;  
the apparatus or installation is arranged and constructed continuously to advance an elongated web of flexible sheet material in succession past said printing station and said embossing station; and  
the embossing coating printing station is for printing the embossing coating on a portion of said major surface of the major face.

23. An apparatus or installation as claimed in Claim 22, characterised in that it is arranged and constructed to advance the elongated web of flexible sheet material past the embossing station and then to the metallising station.

24. An apparatus or installation as claimed in Claim 23, characterised in that it includes at least one colour-printing station (16), arranged in-line with the embossing coating printing station and the embossing station, for colour-printing a coloured coating on an uncoated portion of the surface of said major face.

25. An apparatus or installation as claimed in any one of Claims 22 to 24 inclusive, characterised in that each processing station (40, 48, 56), other than said printing stations and embossing station, is arranged for batchwise processing of the web.

26. An apparatus or installation as claimed in any one of Claims 22 to 25 inclusive,

characterised in that each printing station and the embossing station form part of a single gravure printing press having a plurality of cylinders, each printing station and the embossing station being arranged in-line and each comprising one of the cylinders of the press.

27. An apparatus or installation as claimed in any one of Claims 22 to 26 inclusive, characterised in that the metallising station comprises a vacuum-metallising station, for vacuum-metallising the major face.

28. An apparatus or installation as claimed in any one of Claims 22 to 27 inclusive, characterised in that it includes a laminating station (48) for laminating said major face of the web, after the metallising, to a backing web of flexible sheet material.

29. An apparatus or installation as claimed in any one of Claims 22 to 28 inclusive, characterised in that it includes a slitting station (56) for slitting the metallised web into portions.

30. An apparatus or installation as claimed in any one of Claims 22 to 29 inclusive, characterised in that it includes a rolling station for rolling each metallised web or web portion up into at least one roll.

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